

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. Cancelled.

2. Cancelled.

3. (Currently Amended) An electro-optical device comprising:

an electro-optical substance sandwiched by a pair of a first substrate and a second substrate;

a sealing material disposed between the first substrate and the second substrate for bonding the first substrate and the second substrate to each other at a sealing region along the peripheries, in plan view, of the first substrate and the second substrate;

a plurality of pixel electrodes disposed on the first substrate in an image display region which is enclosed, in plan view, by the sealing region;

wires provided on the first substrate and extending from the inside of the image display region to the outside of the sealing region;

a vertically conducting pad disposed in the sealing region; and

an opposing electrode provided on the second substrate and opposing the pixel electrodes, the opposing electrode including a vertical conductor section which opposes the vertically conducting pad,

wherein at least one part of the sealing material, which is disposed between the vertically conducting pad and the vertical conductor section, includes an electrically conductive material according to Claim 2, wherein the vertically conducting pad occupies at least one of three given sides of the sealing region and is formed at at least one of the four sides of the sealing region at which an inlet for the electro-optical substance is not formed.

4. Cancelled.

5. (Currently Amended) An electro-optical device ~~according to Claim 4,~~
comprising:

an electro-optical substance sandwiched by a pair of a first substrate and a
second substrate;

a sealing material disposed between the first substrate and the second substrate
for bonding the first substrate and the second substrate to each other at a sealing region along
the peripheries, in plan view, of the first substrate and the second substrate;

a plurality of pixel electrodes disposed on the first substrate in an image
display region which is enclosed, in plan view, by the sealing region;

wires provided on the first substrate and extending from the inside of the
image display region to the outside of the sealing region;

a vertically conducting pad disposed in the sealing region; and

an opposing electrode provided on the second substrate and opposing the pixel
electrodes, the opposing electrode including a vertical conductor section which opposes the
vertically conducting pad,

wherein at least one part of the sealing material, which is disposed between the
vertically conducting pad and the vertical conductor section, includes an electrically
conductive material, wherein the sealing material includes a gap-forming member mixed
therein for controlling a gap between the first substrate and the second substrate and
the gap-
forming member includes electrically conductive particles at least in a portion of the sealing
material disposed between the vertically conducting pad and the vertical conductor section.

6. (Original) An electro-optical device according to Claim 5, wherein the
electrically conductive particles are metal-plated bead-like or fiber-like particles.

7. Cancelled.

8. Cancelled.

9. (Currently Amended) An electro-optical device ~~according to Claim 1,~~
comprising:
an electro-optical substance sandwiched by a pair of a first substrate and a
second substrate;
a sealing material disposed between the first substrate and the second substrate
for bonding the first substrate and the second substrate to each other at a sealing region along
the peripheries, in plan view, of the first substrate and the second substrate;
a plurality of pixel electrodes disposed on the first substrate in an image
display region which is enclosed, in plan view, by the sealing region;
wires provided on the first substrate and extending from the inside of the
image display region to the outside of the sealing region;
a vertically conducting pad disposed in the sealing region; and
an opposing electrode provided on the second substrate and opposing the pixel
electrodes, the opposing electrode including a vertical conductor section which opposes the
vertically conducting pad,
wherein at least one part of the sealing material, which is disposed between the
vertically conducting pad and the vertical conductor section, includes an electrically
conductive material, wherein the sealing material includes the electrically conductive
material at least in a portion of the sealing region opposing the vertically conducting pad and
includes an electrically insulative material in the portion of the sealing region not opposing
the vertically conducting pad.

10. (Currently Amended) An electro-optical device ~~according to Claim 1,~~
comprising:
an electro-optical substance sandwiched by a pair of a first substrate and a
second substrate;

a sealing material disposed between the first substrate and the second substrate for bonding the first substrate and the second substrate to each other at a sealing region along the peripheries, in plan view, of the first substrate and the second substrate;

a plurality of pixel electrodes disposed on the first substrate in an image display region which is enclosed, in plan view, by the sealing region;

wires provided on the first substrate and extending from the inside of the image display region to the outside of the sealing region;

a vertically conducting pad disposed in the sealing region; and

an opposing electrode provided on the second substrate and opposing the pixel electrodes, the opposing electrode including a vertical conductor section which opposes the vertically conducting pad,

wherein at least one part of the sealing material, which is disposed between the vertically conducting pad and the vertical conductor section, includes an electrically conductive material, wherein and a surface of the vertically conducting pad formed in the sealing region is disposed on the same plane as that of a surface of an insulation film formed in the sealing region.

11. (Currently Amended) An electro-optical device ~~according to Claim 1,~~ comprising:

an electro-optical substance sandwiched by a pair of a first substrate and a second substrate;

a sealing material disposed between the first substrate and the second substrate for bonding the first substrate and the second substrate to each other at a sealing region along the peripheries, in plan view, of the first substrate and the second substrate;

a plurality of pixel electrodes disposed on the first substrate in an image display region which is enclosed, in plan view, by the sealing region;

wires provided on the first substrate and extending from the inside of the image display region to the outside of the sealing region;

a vertically conducting pad disposed in the sealing region; and

an opposing electrode provided on the second substrate and opposing the pixel electrodes, the opposing electrode including a vertical conductor section which opposes the vertically conducting pad,

wherein at least one part of the sealing material, which is disposed between the vertically conducting pad and the vertical conductor section, includes an electrically conductive material, wherein and a surface of the vertically conducting pad formed in the sealing region is disposed at a level differing from the level of a surface of an insulation film formed in the sealing region, and the sealing material includes gap-forming members having diameters differing from each other in accordance with the size of a gap between the first substrate and the second substrate, the size of the gap varying between a portion of the sealing region in which the vertically conducting pad is formed and another portion of the sealing region in which the insulation film is formed so as to control the gap between the first substrate and the second substrate.

12. (Original) An electro-optical device according to Claim 11, wherein the sealing material including the gap-forming member which has a smaller diameter corresponding to the gap of a smaller size is disposed in a part of the sealing region associated with the gap of a larger size and in the vicinity of a boundary, at which the size of the gap varies, between the portion of the sealing region in which the vertically conducting pad is formed and the other portion of the sealing region in which the insulation film is formed.

13. Cancelled.

14. Cancelled.

15. Cancelled.

16. (Currently Amended) A method for manufacturing an electro-optical device, ~~according to Claim 14, having an electro-optical substance sandwiched by a pair of a first substrate and a second substrate;~~

_____ a sealing material disposed between the first substrate and the second substrate for bonding the first substrate and the second substrate to each other at a sealing region along the peripheries, in plan view, of the first substrate and the second substrate;

_____ a plurality of pixel electrodes disposed on the first substrate in an image display region which is enclosed, in plan view, by the sealing region;

_____ wires provided on the first substrate and extending from the inside of the image display region to the outside of the sealing region;

_____ a vertically conducting pad disposed in the sealing region; and

_____ an opposing electrode provided on the second substrate and opposing the pixel electrodes, the opposing electrode including a vertical conductor section which opposes the vertically conducting pad,

_____ wherein at least one part of the sealing material, which is disposed between the vertically conducting pad and the vertical conductor section, includes an electrically conductive material, the method comprising the steps of:

_____ forming the pixel electrodes, the wires, and the vertically conducting pad on the first substrate;

_____ forming the opposing electrode on the second substrate; and

_____ bonding the first substrate and the second substrate to each other with the sealing material, wherein the step of bonding with the sealing material comprises the steps of applying the sealing material including a gap-forming member having a first diameter to a portion of the sealing region opposing the vertically conducting pad by using a dispenser, and

applying the sealing material including another gap-forming member having a second diameter to another portion of the sealing region not opposing the vertically conducting pad by using another dispenser, the second diameter differing from the first diameter.

17. (Currently Amended) A method for manufacturing an electro-optical device, ~~according to Claim 14, having an electro-optical substance sandwiched by a pair of a first substrate and a second substrate;~~

~~_____ a sealing material disposed between the first substrate and the second substrate for bonding the first substrate and the second substrate to each other at a sealing region along the peripheries, in plan view, of the first substrate and the second substrate;~~

~~_____ a plurality of pixel electrodes disposed on the first substrate in an image display region which is enclosed, in plan view, by the sealing region;~~

~~_____ wires provided on the first substrate and extending from the inside of the image display region to the outside of the sealing region;~~

~~_____ a vertically conducting pad disposed in the sealing region; and~~

~~_____ an opposing electrode provided on the second substrate and opposing the pixel electrodes, the opposing electrode including a vertical conductor section which opposes the vertically conducting pad,~~

~~_____ wherein at least one part of the sealing material, which is disposed between the vertically conducting pad and the vertical conductor section, includes an electrically conductive material, the method comprising the steps of:~~

~~_____ forming the pixel electrodes, the wires, and the vertically conducting pad on the first substrate;~~

~~_____ forming the opposing electrode on the second substrate; and~~

~~_____ bonding the first substrate and the second substrate to each other with the sealing material, wherein the step of bonding with the sealing material comprises the steps of~~

applying the sealing material including an electrically conductive gap-forming member to a portion of the sealing region opposing the vertically conducting pad by using a dispenser, and applying the sealing material including an electrically insulative gap-forming member to another portion of the sealing region not opposing the vertically conducting pad by using another dispenser.

18. Cancelled.

19. Cancelled.

20. (New) An electro-optical device, comprising:

a first substrate including

a plurality of pixel electrodes disposed in an image display region,

a plurality of data lines supplying image signals to the pixel electrodes,

a data line driving circuit,

a sampling circuit which supplies the image signals to the data lines in accordance with sampling-circuit-driving-signals supplied from the data line driving circuit, and

a plurality of lead wires electrically connected between image signal lines and the sampling circuit, disposed between the data line driving circuit and the sampling circuit;

a second substrate including an opposing electrode;

an electro-optical substance sandwiched by the first substrate and the second substrate;

a sealing material disposed between the first substrate and the second substrate that bonds the first substrate and the second substrate to each other at a sealing region along the periphery of the image display region that includes a region of the lead wires;

a vertically conducting pad supplying an opposing-electrode potential-signal to the opposing electrode, faced with at least one of three sides in which the region of the lead wires of the sealing region above the first substrate is not formed;

a vertical conductor section opposing the vertically conducting pad above the second substrate;

a conductive gap-forming member mixed into the sealing material that is disposed between the vertically conducting pad and the vertical conductor section; and

a non-conductive gap-forming member mixed into the sealing material in the region of the lead wires.

REMARKS

Claims 3, 5, 6, 9-12, 16, 17 and 20 are pending in this application. By this Amendment, the title of the invention is amended to overcome the objection in the Office Action, rejected claims 1, 2, 4, 7, 8, 13-15, 18 and 19 are cancelled and objected to claims 3, 5, 6, 9-12, 16 and 17 are amended into independent form. New claim 20 is added. Reconsideration in view of the forgoing amendments is respectfully requested.

Applicants appreciate the Office Action's indication that claims 3, 5, 6, 9-12, 16 and 17 would be allowable if rewritten to incorporate the features of independent claim 1 as well as any intervening claims.

The Office Action rejects claims 1, 2, 7, 8, 13 and 14 under 35 U.S.C. §102(b) over JP-11-119242 to Inoue et al. ("Inoue"); and rejects claims 4, 15, 18 and 19 under 35 U.S.C. §103(a) over Inoue. The above amendments render these rejections moot. Applicants note that although the Office Action refers to JP 11-119242 as Hiroyasu et al. ("Hiroyasu"), Hiroyasu is actually the first inventor's first name; therefore, throughout this Amendment, the Japanese reference will be referred to as Inoue.

Applicants submit that the rejections have been overcome by cancellation of each of the rejected claims. Moreover, in accordance with the suggestion in the Office Action, claims 3, 5, 9-11, 16 and 17 have been amended to incorporate the subject matter of the independent claim and any intervening claims. Dependent claims 6 and 12 depend on newly amended claims 5 and 11 respectively. Therefore, Applicants submit that claim 3, 5, 6, 9-12, 16 and 17 define patentable subject matter.

Regarding new claim 20, Applicants respectfully submit that Inoue fails to disclose or suggest an electro-optical device comprising: a first substrate including a plurality of pixel electrodes disposed in an image display region, a plurality of data lines supplying image signals to the pixel electrodes, a data line driving circuit, a sampling circuit which supplies

the image signals to the data lines in accordance with sampling-circuit-driving-signals supplied from the data line driving circuit, and a plurality of lead wires electrically connected between image signal lines and the sampling circuit, disposed between the data line driving circuit and the sampling circuit; a second substrate including an opposing electrode; an electro-optical substance sandwiched by the first substrate and the second substrate; a sealing material disposed between the first substrate and the second substrate that bonds the first substrate and the second substrate to each other at a sealing region along the periphery of the image display region that includes a region of the lead wires; a vertically conducting pad supplying an opposing-electrode potential-signal to the opposing electrode, faced with at least one of three sides in which the region of the lead wires of the sealing region above the first substrate is not formed; a vertical conductor section opposing the vertically conducting pad above the second substrate; a conductive gap-forming member mixed into the sealing material that is disposed between the vertically conducting pad and the vertical conductor section; and a non-conductive gap-forming member mixed into the sealing material in the region of the lead wires, as recited in claim 20.

Inoue discloses an electro-optical device comprising an electro-optical substance sandwiched by first and second substrates. Inoue also discloses a plurality of pixel electrodes in an image display region that are enclosed by the sealing region and wires which extend from an inside of the image display region to a position outside the sealing region. Inoue also discloses a vertically conducting pad and an opposing vertically conducting pad and a conductive paste 28 which connects the common electrode 18 to the connection wiring 22b. However, Inoue fails to teach a conductive gap-forming member mixed into the sealing material that is disposed between the vertically conducting pad and the vertical conductor section. The conductive gap-forming member of Inoue is separate from the sealing material 16. In addition, Inoue does not teach a non-conductive gap-forming member mixed into the

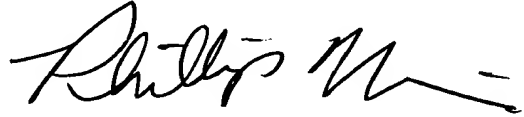
sealing material in the region of the lead wires. Finally, Inoue fails to teach a sampling circuit which supplies the image signals to the data lines in accordance with sampling-circuit-driving-signals supplied from the data line driving circuit.

As seen, for example, in Fig. 8 of this application, conductive gap-forming member 202 is included in the sealing material 52 disposed between the vertically conducting pad 106 and the vertically conductor section 101A, whereby the sealing material 52 functions as a vertical conductor there between. Thus, as discussed at paragraph [0068], by the structure of claim 20, the size of the TFT-arrayed substrate 10 can be reduced or the size of an image display region can be increased with respect to the size of the TFT-arrayed substrate because the sealing region includes a vertically conductive region. Moreover, the configuration of the device and manufacturing processes can be simplified when at least one part of the sealing material 52 also functions as a vertical conductor. Inoue neither anticipates nor is capable of achieving these benefits. Thus, Applicants respectfully submit that claim 20 is patentable over Inoue.

Applicants submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 3, 5, 6, 9-12, 16, 17 and 20 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:
Amendment Transmittal

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